(reactivity and interdiffusion of alternative SOFC cathodes with yttria stabilized zirconia, gadolinia doped ceria and doped lanthanum gallate solid electrolytes)

IT 12036-39-4, Strontium zirconium oxide SrZrO3 12052-28-7, Cobalt iron oxide **CoFe2O4** 12165-18-3, Praseodymium zirconium oxide Pr2Zr2O7
(reactivity and interdiffusion of alternative SOFC cathodes with yttria stabilized zirconia, gadolinia doped ceria and doped lanthanum gallate solid electrolytes)

L26 ANSWER 4 OF 15 HCA COPYRIGHT 2003 ACS on STN
133:210643 Manufacture of **cathode** active materials and secondary lithium **batteries** comprising of the materials. Uchikawa, Hideoki; Maekawa, Takeyuki; Nozaki, Ayumu; Miyashita, Shoji (Mitsubishi Electric Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2000243392 A2 20000908, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-37328 19990216.

AB An AFe2O4 (A = Mn, Fe, Zn, Co, Ni, or Cr) soln. is mixed with (a) Li ion-contg. inorg. salt, (b) an inorg. salt contg. Co, Ni, Mn, and/or Fe, and (c) a complexing agent for Li and the metals in b, at ionic ratio of Li:(metals in b) = 1:0.5-1.0, freeze dried by atomization, and heat treated to give a **cathode** active material. Thus prepd. **cathode** active materials having main component compn. formula of LiMxO2 (M = Co, Ni, Mn, or Fe; x = 0.5-1.0) and **nonaq**. secondary lithium **batteries** comprising the **cathodes** are also claimed. **Cathode** active materials are manufd. from **ferrites** at low cost.

IT **12052-28-7**, Cobalt iron oxide (**CoFe2O4**)
(low cost manuf. of **nonaq**. secondary lithium **battery cathodes** from **ferrites**)

RN 12052-28-7 HCA
CN Cobalt iron oxide (CoFe2O4) (8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	4	17778-80-2
Co	1	7440-48-4
Fe	2	7439-89-6

IC ICM H01M004-58
ICS C01G049-00; C01G051-00; C01G053-00; H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 77

ST secondary lithium **battery cathode** manuf; lithium mixed oxide **cathode** manuf; **ferrite** treatment lithium **battery cathode** manuf

IT Secondary **batteries**
(lithium, **nonaq**.; low cost manuf. of **nonaq**. secondary lithium **battery cathodes** from **ferrites**)

IT **Battery cathodes**

(low cost manuf. of **nonaq**. secondary lithium **battery cathodes** from **ferrites**)

IT **Ferrites**
(low cost manuf. of **nonaq**. secondary lithium **battery cathodes** from **ferrites**)

IT 7439-89-6, Iron, uses 7440-66-6, Zinc, uses
(**cathode** active material contg.; low cost manuf. of **nonaq**. secondary lithium **battery cathodes** from **ferrites**)

IT 12031-65-1P, Lithium nickel oxide (LiNiO2) 12057-17-9P, Lithium manganese oxide (LiMn2O4) 12190-79-3P, Cobalt lithium oxide (CoLiO2) 113066-89-0P, Cobalt lithium nickel oxide (Co0.2LiNi0.8O2)
(**cathode** active material; low cost manuf. of **nonaq**. secondary lithium **battery cathodes** from **ferrites**)

IT 77-92-9, Citric acid, processes 87-69-4, Tartaric acid, processes 110-15-6, Succinic acid, processes 110-16-7, Maleic acid, processes 141-82-2, Malonic acid, processes 144-62-7, Oxalic acid, processes 373-02-4, Nickel acetate 546-89-4, Lithium acetate 1310-65-2, Lithium hydroxide 7447-41-8, Lithium chloride, processes 7646-79-9, Cobalt chloride, processes 7718-54-9, Nickel chloride, processes 7789-24-4, Lithium fluoride, processes 7790-69-4, Lithium nitrate 10141-05-6, Cobalt nitrate 10377-48-7, Lithium sulfate 10377-66-9, Manganese nitrate **12052-28-7**, Cobalt iron oxide (**CoFe2O4**) 12054-48-7, Nickel hydroxide 12063-10-4, Iron manganese oxide (Fe2MnO4) 12168-54-6, Iron nickel oxide (Fe2NiO4) 106218-90-0, Iron manganese zinc oxide [Fe2(Mn,Zn)O4] 106389-78-0, Iron nickel zinc oxide [Fe2(Ni,Zn)O4]
(low cost manuf. of **nonaq**. secondary lithium **battery cathodes** from **ferrites**)

L26 ANSWER 5 OF 15 HCA COPYRIGHT 2003 ACS on STN

130:315411 Interface physical chemistry of enamel (Part 3) Action of cobalt on enamel reaction. Shirasaki, Masahiro; Shimizu, Tadao; Kozuka, Tatsuya; Jiang, Zhaohua (Department of Industrial Chemistry, Chiba Institute of Technology, Chiba, 275-0016, Japan). Journal of the Ceramic Society of Japan, 107(Mar.), 222-228 (Japanese) 1999. CODEN: JCSJEW. ISSN: 0914-5400. Publisher: Ceramic Society of Japan.

AB The effect of cobalt on enamel interface reaction was studied. Observation and anal. of Co-vitreous enamel interface were performed with SEM, X-ray photoelectron spectrometry and X-ray diffractometer. The sunken parts of Co-vitreous enamel interface were formed by erosion of the base iron. Cobalt and iron deposited on the base iron and formed convex parts. Further, the convex parts grew by firing from the initial interface towards the glass (enamel layer) side. Interface layer of Co-vitreous enamel consisted of two layers. The first interface layer was very thin and consisted of **CoFe2O4** or FeFe2O4. The second interface layer was the iron solid soln. contg. cobalt. The thickness of Co-vitreous enamel

reaction layer was thicker than the rough parts. The Co-vitreous enamel reaction was a **galvanic cell** reaction between base iron and cobalt ion in glass. Cobalt is transported by reaction as deposition, oxidn. and dissoln.

CC 57-4 (Ceramics)
Section cross-reference(s): 55

IT 1317-61-9, Iron oxide fe3o4, formation (nonpreparative)
12052-28-7, Cobalt iron oxide (**CoFe2O4**) 12781-95-2
(interface reaction layer; effects of Co reaction with enamel on steel substrate-enamel interface structure and chem.)

L26 ANSWER 6 OF 15 HCA COPYRIGHT 2003 ACS on STN
128:272815 Secondary **nonaqueous** electrolyte **batteries** containing magnetic additives. Yamazaki, Kanya; Noma, Toshiyuki; Nishio, Akiji (Sanyo Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 10106577 A2 19980424 Heisei, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1996-256315 19960927.

AB The **batteries** use **electrodes** contg. a magnetic additive in their active mass layers. The additives may be **ferrite** or samarium magnets, the **anodes** are carbonaceous **anodes**, and the **cathodes** are Li contg. Fe, Mn, and/or Co oxide.

IC ICM H01M004-62
ICS H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium **battery electrode** magnetic additive; **ferrite** magnet lithium **battery electrode** ; samarium magnet lithium **battery electrode**

IT **Battery electrodes**
(**electrodes** contg. magnetic additives for secondary lithium **batteries**)

IT Coke
(**electrodes** contg. magnetic additives for secondary lithium **batteries**)

IT Magnets
(**ferrite** and samarium; **electrodes** contg. magnetic additives for secondary lithium **batteries**)

IT 7782-42-5, Graphite, uses 39300-70-4, Lithium nickel oxide 39457-42-6, Lithium manganese oxide 52627-24-4, Cobalt lithium oxide
(**electrodes** contg. magnetic additives for secondary lithium **batteries**)

L26 ANSWER 7 OF 15 HCA COPYRIGHT 2003 ACS on STN
128:259105 Manufacture of rock salt-structure lithium **ferrite** by ion exchanging in solvothermal treatment. Tabuchi, Koushun; Ado, Kazuaki; Kageyama, Hiroshi; Nakamura, Isao (Agency of Industrial Sciences and Technology, Japan). Jpn. Kokai Tokkyo Koho JP 10067519 A2 19980310 Heisei, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1996-245558 19960827.

AB Rock salt-structure LiFeO2 is manufd. by hydrothermal reaction of .alpha.-FeOOH in aq. NaOH at 130-300.degree. to obtain

.alpha.-NaFeO2 (I) and solvothermal treatment of I with inorg. Li salts in **nonaq**. solvents at 130-300.degree.. Alternatively, a Na compd. and a trivalent Fe compd. are reacted directly to form I. The LiFeO2 useful for secondary **battery cathode** can be manufd. in low cost.

IC ICM C01G049-00
ICS H01M004-04; H01M004-58

CC 49-3 (Industrial Inorganic Chemicals)

ST rock salt structure lithium **ferrite** manuf; ion exchanging solvothermal treatment lithium **ferrite**; sodium iron oxide solvothermal treatment; **nonaq** solvent solvothermal reaction

IT Hydrothermal reactions
Ion exchange
(manuf. of rock salt-structure lithium **ferrite** by ion exchanging in solvothermal treatment)

IT 497-19-8, Sodium carbonate, reactions 1309-37-1, Ferric oxide, reactions 1310-65-2, Lithium hydroxide 1310-73-2, Sodium hydroxide, reactions 1313-60-6, Sodium oxide (Na2O2) 7447-41-8, Lithium chloride, reactions 7550-35-8, Lithium bromide 7789-24-4, Lithium fluoride, reactions 7790-69-4, Lithium nitrate 10377-51-2, Lithium iodide 11115-92-7, Iron oxyhydroxide
(for manuf. of rock salt-structure lithium **ferrite** by ion exchanging in solvothermal treatment)

IT 12062-85-0P, Sodium iron oxide (NaFeO2)
(intermediate; for manuf. of rock salt-structure lithium **ferrite** by ion exchanging in solvothermal treatment)

IT 12022-46-7P, Lithium iron oxide (LiFeO2)
(manuf. of rock salt-structure lithium **ferrite** by ion exchanging in solvothermal treatment)

IT 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 67-64-1, Acetone, uses 71-23-8, Propanol, uses 71-36-3, Butanol, uses 110-54-3, Hexane, uses
(solvents; manuf. of rock salt-structure lithium **ferrite** by ion exchanging in solvothermal treatment)

L26 ANSWER 8 OF 15 HCA COPYRIGHT 2003 ACS on STN

123:175022 Secondary **batteries** with **nonaqueous** electrolytes. Nakajima, Masayoshi; Tsucha, Kenji; Oohashi, Hirobumi (Toshiba Battery, Japan). Jpn. Kokai Tokkyo Koho JP 07161382 A2 19950623 Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-311529 19931213.

AB In **batteries** comprising **cathodes**, Li ion-intercalatable **anodes**, and electrolyte; the **anode** cans and/or collectors are made of ferritic stainless steels contg. 17.0-20.0% Cr and 1.75-2.5% Mo. Preferably, the **cathodes** mainly comprise LiMn2O4, LiM1aMn2-aO4 (M = Co, Mg, Ni; 0.03 .ltoreq. a .ltoreq. 0.4), LiCoO2, LiaCo1-bM2bO2 (M2 = Ni, Mn, Sn, Al, V; 0.03 .ltoreq. b .ltoreq. 0.4), or V2O5. The **batteries** have excellent overdischarging characteristics.

IC ICM H01M010-40
ICS H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 55
ST **ferrite** stainless steel **anode battery**; molybdenum chromium stainless steel **anode**; **nonaq** **battery anode**
IT Cans
(**anode**; **nonaq**. lithium **batteries** with ferritic stainless steel **anode** cans and/or collectors)
IT **Anodes**
(**battery**, cans and/or collectors; **nonaq**. lithium **batteries** with ferritic stainless steel **anode** cans and/or collectors)
IT 1314-62-1, Vanadium oxide (v2o5), uses 12057-17-9, Lithium manganese oxide (limn2o4) 12190-79-3, Cobalt lithium oxide (colio2)
(**cathode**; **nonaq**. lithium **batteries** with ferritic stainless steel **anode** cans and/or collectors)
IT 54824-47-4, SUS 444
(**nonaq**. lithium **batteries** with ferritic stainless steel **anode** cans and/or collectors)

L26 ANSWER 9 OF 15 HCA COPYRIGHT 2003 ACS on STN
122:13763 Secondary **nonaqueous**-electrolyte lithium **batteries** for long cycle life. Yoshimura, Seiji; Maeda, Takeshi; Nishio, Koji; Saito, Toshihiko (Sanyo Electric Co, Japan). Jpn. Kokai Tokkyo Koho JP 06231765 A2 19940819 Heisei, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-40430 19930204.
AB The **batteries** use Li-intercalatable FeO **anodes**. Alternatively, the **batteries** use Li-intercalatable Fe-transition metal mixed oxide **anodes**. The mixed oxides may contain 0.05-5% transition metals based on the metal content.
IT **12052-28-7**, Cobalt iron oxide
(**battery anodes** from lithium-intercalatable)
RN 12052-28-7 HCA
CN Cobalt iron oxide (CoFe2O4) (8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	4	17778-80-2
Co	1	7440-48-4
Fe	2	7439-89-6

IC ICM H01M004-52
ICS H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery anode** lithium iron oxide; transition metal oxide **battery anode**
IT **Anodes**
(**battery**, lithium-intercalatable iron oxide or

iron-transition metal mixed oxide for secondary)
IT 1345-25-1, Iron oxide (FeO), uses 11115-91-6, Iron manganese oxide 11115-97-2, Iron molybdenum oxide 11129-48-9, Iron zinc oxide 12018-79-0, Copper iron oxide **12052-28-7**, Cobalt iron oxide 12656-79-0, Iron silver oxide 12707-85-6, Iron nickel oxide 12737-27-8, Chromium iron oxide 12789-64-9, Iron titanium oxide 37220-08-9, Iron vanadium oxide 39361-81-4, Iron zirconium oxide 51311-93-4, Cadmium iron oxide 58500-36-0, Iron niobium oxide 63575-05-3, Iron mercury oxide (FeHgO4)
(**battery anodes** from lithium-intercalatable)

L26 ANSWER 10 OF 15 HCA COPYRIGHT 2003 ACS on STN
121:160779 Stainless steel **cathode** case for compact high-capacity **nonaqueous** electrolyte **battery**.
Hayasaka, Toyoo; Harada, Toyoo; Sakai, Tsugio; Ohshida, Junko (Seiko electronic Co. Ltd., Japan). Eur. Pat. Appl. EP 599654 A1 19940601, 12 pp. DESIGNATED STATES: R: CH, DE, FR, GB, LI. (English). CODEN: EPXXDW. APPLICATION: EP 1993-309441 19931126. PRIORITY: JP 1992-317296 19921126; JP 1993-241593 19930928.
AB For reduced cost of pos. **electrode** cases and improved productivity by suppressing **anodic** oxidn. of the case without an Al layer inside, the **battery** uses a high grade corrosion resistance austenitic **ferrite** two-phase stainless steel (Ni 4.5-13, Cr 20-26, Mo 2-4, N 0.05-0.3%) for the case. The pitting index of the case is 30.5-45 as calcd. by Cr% + 3 x Mo% + 16 x N%.
IC ICM H01M002-02
ICS H01M004-66
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery nonaq** stainless steel case
IT Polyacenes
(**electrodes**, in **nonaq**. compact **batteries** with austenitic **ferrite** two-phase **battery** case)
IT **Batteries**, primary
(**nonaq**., compact, with high capacity electrolytes and stainless steel case)
IT 110-71-4, 1,2-Dimethoxyethane
(**anode**, in **nonaq**. compact **batteries** with austenitic **ferrite** two-phase **battery** case)
IT 12597-68-1, Stainless steel, uses 61584-44-9 72266-91-2, SUS329J1 157451-93-9 157511-87-0 157511-88-1
(austenitic, **ferrite**, two-phase, **battery** case from)
IT 1313-13-9, Manganese dioxide, uses
(**cathode**, in **nonaq**. compact **batteries** with austenitic **ferrite** two-phase **battery** case)
IT 108-32-7, Propylene carbonate 7791-03-9, Lithium perchlorate
(**electrodes**, in **nonaq**. compact **batteries** with austenitic **ferrite** two-phase

battery case)

L26 ANSWER 11 OF 15 HCA COPYRIGHT 2003 ACS on STN
119:99893 Secondary **nonaqueous** lithium **batteries** and their preparation. Hasegawa, Masaki; Murai, Sukeyuki; Ito, Shuji; Mifuji, Yasuhiko; Toyoguchi, Yoshinori (Matsushita Electric Ind Co Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 05062679 A2 19930312 Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1991-222623 19910903.
AB The **batteries** use .beta.-Li **ferrite**-based **cathode**-active mass prepd. by firing mixt. of Li salts and .gtoreq.1 of FeOOH, Fe hydroxide, Fe oxalate, and Fe ammonium oxalate. Preferably, the firing temp. is 350-500.degree. and the Li:Fe mol ratio is 0.8-1.2:1.0. The **batteries** have high energy d.
IC ICM H01M004-58
ICS H01M004-02; H01M004-04; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium **ferrite battery cathode**; iron lithium oxide **battery cathode**
IT **Cathodes**
(**battery**, lithium **ferrites**, prepn. of)
IT 12022-46-7P
(.beta.-, prepn. of, for lithium **battery cathodes**)

L26 ANSWER 12 OF 15 HCA COPYRIGHT 2003 ACS on STN
117:98652 Equilibrium studies of the system iron cobalt oxide-iron cobalt oxide ("(Fe,Co)O"-(Fe,Co)3O4) by solid-state emf measurements in the temperature range 970 to 1370 K. Lundberg, Mats; Rosen, Erik (Dep. Inorg. Chem., Univ. Umea, Umea, S-901 87, Swed.). Journal of the American Ceramic Society, 75(6), 1452-7 (English) 1992. CODEN: JACTAW. ISSN: 0002-7820.
AB The equil. reaction 3'(Fe,Co)O'(ss) +1/2O2(g) .dblarw. (Fe,Co)3O4(ss) was studied in the temp. range 970 to 1370 K for seven different total compns. of molar ratios 0.5 < Fe/(Fe + Co) .ltoreq. 1.0. The equil. pressures of oxygen were detd. by using **galvanic cells** incorporating calcia stabilized zirconia as solid electrolyte and the Fe/Co ratios in the solid-soln. phases by wavelength dispersive spectrometry microprobe analyses. The activities of "FeO" in the cobaltowestite phase were then derived from the exptl. results obtained.
CC 68-8 (Phase Equilibriums, Chemical Equilibriums, and Solutions)
Section cross-reference(s): 67
IT 12052-28-7, Cobalt iron oxide (**CoFe2O4**)
(equil. reactions of, with oxygen)

L26 ANSWER 13 OF 15 HCA COPYRIGHT 2003 ACS on STN
116:177643 Comments on thermodynamic data of oxidic substances and systems important for solid oxide fuel cells. Balej, J.; Divisek, J. (Consult. Bur. Chem. Eng., Juelich, D-5170, Germany). Comm. Eur. Communities, [Rep.] EUR, EUR 13564, Proc. Int. Symp. Solid Oxide

Fuel Cells, 2nd, 1991, 813-20 (English) 1991. CODEN: CECED9. ISSN: 0303-755X.

AB A crit. evaluation of published thermodn. data was carried out for individual simple oxides as well as more or less complicated oxidic systems important for the construction of solid oxide fuel cells. The known thermodn. data and their temp. dependences are only sufficiently reliable for a few simple oxides existing in a single stable valence state (CaO, MgO, SrO, Al2O3, La2O3, Y2O3, ZrO2). For polyvalent oxides (MnOx, CrOx, NiOx), there are still some discrepancies in the published data. Similar conclusions are valid for more or less complicated oxidic systems. In some cases, erroneous published data were cor. by rigorous thermodn. treatment of the available original results of measurements (e.g., in the CaO-CrOx system with the formation of CaCr2O4, Ca5(CrO4)3, Ca10(CrO4)7, and CaCrO4). In the CrOx-MnOx system, the as yet unknown thermodn. data for MnCr2O4 and Mn2CrO4 were estd. on the basis of known data for similar oxidic compds. Mn3O4, Fe3O4, MnFe2O4, **CoFe2O4**, FeCr2O4, and **CoFe2O4**.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 69

IT Electric conductors, ceramic
Fuel-**cell electrolytes**
(oxides, thermodn. data for)

L26 ANSWER 14 OF 15 HCA COPYRIGHT 2003 ACS on STN

99:219558 Thermodynamic study of spinel-type solid solutions of ferric oxide-cobalt iron oxide by EMF method. Katayama, Iwao; Matsuda, Toshiteru; Kozuka, Zensaku (Dep. Metall. Eng., Osaka Univ., Suita, Japan). Nippon Kinzoku Gakkaishi, 47(10), 858-62 (Japanese) 1983. CODEN: NIKGAV. ISSN: 0369-4186.

AB Emf. measurements of the **galvanic cells** with ZrO2 + CaO solid electrolyte were carried out to det. the activity of Fe3O4 in the spinel-type solid solns. of Fe3O4-**CoFe2O4** coexisting with Fe2O3 at 1100-1300 K in the whole compn. range. The activity of Fe3O4, derived from the emf. values, showed small neg. deviations from Raoult's law in the entire compn. range and obeyed Henry's law in the range xFe3O4 = 0-0.4.

CC 68-1 (Phase Equilibriums, Chemical Equilibriums, and Solutions)

L26 ANSWER 15 OF 15 HCA COPYRIGHT 2003 ACS on STN

93:98492 **Batteries** with **nonaqueous** electrolyte.
Furukawa, Sanehiro; Moriwaki, Kazuo (Sanyo Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 55046288 19800331 Showa, 2 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1978-120629 19780928.

AB The title **batteries** contain a Li or Mg **anode** and an Fe-Co oxide **cathode**. Thus, a soln. contg. Fe2(SO4)3 and Co sulfate was treated with a NaOH soln. to obtain an Fe and Co oxide coppt. The coppt. was mixed with acetylene black and fluorocarbon and pressed on the **battery** container to prep. a **cathode**. The **anode** was prepd. from a Li sheet and Ni mesh. The electrolyte consisted of propylene carbonate, MeOCH2CH2OMe, and LiClO4. The output voltage of the **battery**

was higher than that of a **battery** using an Fe oxide **cathode**.

IT **11115-75-6**
(**cathodes**, in org.-electrolyte **battery** with lithium **anode**)

RN 11115-75-6 HCA
CN Cobalt iron oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Co	x	7440-48-4
Fe	x	7439-89-6

IC H01M004-06; H01M006-16
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** lithium org electrolyte; iron cobalt oxide **battery cathode**
IT **Batteries**, primary
(lithium, org.-electrolyte)
IT **11115-75-6**
(**cathodes**, in org.-electrolyte **battery** with lithium **anode**)

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L27 ANSWER 1 OF 18 HCA COPYRIGHT 2003 ACS on STN
138:15247 Secondary **nonaqueous**-electrolyte **battery** with controlled charging of **anode**. Ueda, Atsushi; Kimachi, Seiya (Hitachi Maxell Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002352797 A2 20021206, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-160766 20010529.

AB The title **battery** is equipped with an **anode** contg. a Li-Si alloy and C and a **cathode** contg. a Li metal mixed oxide, where charging amt. of the **anode** is controlled below **anode** utilization (UA) represented as follows; UA (%) = [4199 .times. .beta./100 .times. .alpha./100 + 372 .times. (1 - .alpha.)/100]/[4199 .times. .alpha./100 + 372 .times. (1 - .alpha.)/100] .times. 100; where .alpha. = Si content (%); 0 < .alpha. .ltoreq. 70; .beta. = Si utilization; 0 < .beta. .ltoreq. 45. The **battery** has high capacity and long cycle life.

IT **68848-64-6**
(**anode** contg. carbon and; charging of **anode** based on utilization in **nonaq**.-electrolyte **battery**)

RN 68848-64-6 HCA
CN Lithium alloy, nonbase, Li,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number

=========+===============
Li 7439-93-2
Si 7440-21-3

IC ICM H01M004-02
ICS H01M004-58; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **anode** lithium silicon alloy carbon charging **nonaq** **battery**
IT **Battery anodes**
(charging of **anode** based on utilization in **nonaq**.-electrolyte **battery**)
IT Secondary **batteries**
(lithium; charging of **anode** based on utilization in **nonaq**.-electrolyte **battery**)
IT **68848-64-6**
(**anode** contg. carbon and; charging of **anode** based on utilization in **nonaq**.-electrolyte **battery**)
IT 7440-44-0, Carbon, uses
(**anode** contg. lithium-silicon alloy and; charging of **anode** based on utilization in **nonaq** .-electrolyte **battery**)
IT 12031-75-3, Lithium manganese nickel oxide (Li2Mn3NiO8)
128975-24-6, Lithium manganese nickel oxide (Li2MnNiO4)
155472-67-6, Lithium manganese oxide (Li1.05Mn1.95O4)
(**cathode**; charging of **anode** based on utilization in **nonaq**.-electrolyte **battery**)

L27 ANSWER 2 OF 18 HCA COPYRIGHT 2003 ACS on STN
137:22410 Lithium-aluminum dual-cation rechargeable **electrochemical battery cell**. Amatucci, Glenn G. (USA). U.S. Pat. Appl. Publ. US 2002076618 A1 20020620, 9 pp. (English). CODEN: USXXCO. APPLICATION: US 2000-739566 20001218.
AB A rechargeable **battery** cell having high operating voltage and significantly increased specific capacity comprises a pos. **electrode** member, a neg. **electrode** member, and an interposed separator member contg. an electrolyte comprising a soln. of a polyvalent aluminum cation solute in a **nonaq**. solvent. The pos. **electrode** member comprises an active material which reversibly takes up and releases the reactive polyvalent cation species during operation of the cell while the active material of the neg. **electrode** contemporaneously reversibly releases into and takes up from the electrolyte solvent a monovalent cation species. Preferred cation species are those of aluminum, such as Al3+, and alkali metals, such as Li+.
IT **68848-64-6**
(lithium-aluminum dual-cation rechargeable **electrochem**. **battery cell**)
RN 68848-64-6 HCA
CN Lithium alloy, nonbase, Li,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Li	7439-93-2
Si	7440-21-3

IC ICM H01M010-40
ICS H01M004-48; H01M004-58
NCL 429324000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium aluminum dual cation rechargeable **battery**
IT Alloys, uses
(alkali metal; lithium-aluminum dual-cation rechargeable **electrochem. battery cell**)
IT Alkali metals, uses
(alloys; lithium-aluminum dual-cation rechargeable **electrochem. battery cell**)
IT Transition metal halides
(fluorides; lithium-aluminum dual-cation rechargeable **electrochem. battery cell**)
IT Alkali metals, uses
Carbonaceous materials (technological products)
Transition metal oxides
Transition metal sulfides
(lithium-aluminum dual-cation rechargeable **electrochem. battery cell**)
IT Carbon black, uses
(lithium-aluminum dual-cation rechargeable **electrochem. battery cell**)
IT Secondary **batteries**
(lithium; lithium-aluminum dual-cation rechargeable **electrochem. battery cell**)
IT Fluorides, uses
(transition metal; lithium-aluminum dual-cation rechargeable **electrochem. battery cell**)
IT Lithium alloy, base
Sodium alloy, base
(lithium-aluminum dual-cation rechargeable **electrochem. battery cell**)
IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate 1314-62-1, Vanadium pentoxide, uses 7439-93-2, Lithium, uses 7440-21-3, Silicon, uses 7440-23-5, Sodium, uses 7440-44-0D, Carbon, fluorides 12612-50-9, Molybdenum sulfide 14017-56-2, Yttrium perchlorate 17341-24-1, uses 17341-25-2, Sodium ion, uses 18459-37-5, Cesium ion, uses 21324-40-3, Lithium hexafluorophosphate 22537-23-1, Aluminum(3+), uses 22537-38-8, Rubidium ion, uses 24203-36-9, Potassium ion, uses 33454-82-9, Lithium triflate 74974-61-1, Aluminum triflate
(lithium-aluminum dual-cation rechargeable **electrochem. battery cell**)
IT **68848-64-6**

(lithium-aluminum dual-cation rechargeable **electrochem.** **battery cell**)
IT 84-74-2, Dibutyl phthalate 9011-17-0, Kynar 2801
(lithium-aluminum dual-cation rechargeable **electrochem.** **battery cell**)

L27 ANSWER 3 OF 18 HCA COPYRIGHT 2003 ACS on STN
136:372275 Secondary **nonaqueous**-electrolyte **battery** with **cathode** containing transition metal oxide. Kusumoto, Yasuyuki; Fujimoto, Masahisa; Fujitani, Noboru (Sanyo Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002151074 A2 20020524, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-345124 20001113.
AB The title **battery** is equipped with a **cathode** contg. a transition metal oxide having space group R3m crystal structure (except LiCoO2) and a Li-contg. **anode**. Preferably, the transition metal oxide is NaFeO2. The **battery** has high capacity and energy d.
IT **68848-64-6**
(**anode**; **cathode** contg. specified transition metal oxide for **nonaq**.-electrolyte **battery**)
RN 68848-64-6 HCA
CN Lithium alloy, nonbase, Li,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Li	7439-93-2
Si	7440-21-3

IC ICM H01M004-58
ICS H01M004-40; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST transition metal oxide **cathode** **nonaq** **battery**; iron sodium oxide **cathode** **nonaq** **battery**
IT **Battery** **cathodes**
(**cathode** contg. specified transition metal oxide for **nonaq**.-electrolyte **battery**)
IT Transition metal oxides
(**cathode** contg. specified transition metal oxide for **nonaq**.-electrolyte **battery**)
IT Secondary **batteries**
(lithium; **cathode** contg. specified transition metal oxide for **nonaq**.-electrolyte **battery**)
IT 7439-93-2, Lithium, uses **68848-64-6**
(**anode**; **cathode** contg. specified transition metal oxide for **nonaq**.-electrolyte **battery**)
IT 12062-85-0, Iron sodium oxide (FeNaO2)
(**cathode** contg. specified transition metal oxide for **nonaq**.-electrolyte **battery**)

L27 ANSWER 4 OF 18 HCA COPYRIGHT 2003 ACS on STN
136:250286 **Anode** active mass for secondary **nonaqueous** electrolyte **battery**. Sato, Toshitada; Nakamoto, Takayuki; Shimamura, Harushige; Yonemura, Koji; Negi, Noriyuki; Takeshita, Yukiteru; Yamamoto, Hiroyoshi; Kohiyori, Motoji (Sumitomo Metal Industries Ltd., Japan; Matsushita Electric Industrial Co., Ltd.). Jpn. Kokai Tokkyo Koho JP 2002093411 A2 20020329, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-273853 20000908.

AB The **anode** active mass contains a non-cryst. Si and/or Ge phase. The **anode** active mass may also contain a Si and/or Ge intermetallic compd. with Group IIA, transition metal, Group IIIA, and/or Group IVA elements.

IT **403861-30-3**, Lithium silicide (Li7Si6)
(noncryst. intermetallic compd. **anode** active mass for secondary lithium **batteries**)

RN 403861-30-3 HCA

CN Lithium silicide (Li7Si6) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Si	6	7440-21-3
Li	7	7439-93-2

IC ICM H01M004-38
ICS C22C045-00; H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary **battery anode** noncryst silicon; germanium noncryst **anode** secondary **battery**; intermetallic compd secondary **battery anode**

IT **Battery anodes**
(noncryst. silicon and germanium and intermetallic compd. **anode** active mass for secondary lithium **batteries**)

IT 7440-56-4, Germanium, uses
(noncryst. germanium **anode** active mass for secondary lithium **batteries**)

IT 7440-02-0D, Nickel, intermetallic compds. with germanium 7440-32-6D, Titanium, intermetallic compds. with silicon 7440-48-4D, Cobalt, intermetallic compds. with silicon 7440-62-2D, Vanadium, intermetallic compds. with silicon 12064-90-3 12201-89-7, Nickel silicide (NiSi2) **403861-30-3**, Lithium silicide (Li7Si6)
(noncryst. intermetallic compd. **anode** active mass for secondary lithium **batteries**)

IT 7440-21-3, Silicon, uses
(noncryst. silicon **anode** active mass for secondary lithium **batteries**)

L27 ANSWER 5 OF 18 HCA COPYRIGHT 2003 ACS on STN
136:105174 **Nonaqueous** electrolyte lithium secondary **batteries** with excellent charge-discharge cycle

characteristics. Yoshimura, Seiji; Okamoto, Takashi; Matsuda, Shigeki; Fujitani, Shin (Sanyo Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002025551 A2 20020125, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-203644 20000705.

AB The **battery** comprises a Li-Si alloy flat plate **anode** placed in between a pair of opposing **cathodes** and a **nonaq**. electrolyte soln. contg. solvent and electrolyte. The **anode** may be obtained by electrochem. insertion of Li into Si or by lamination of Li with Si. The **cathodes** may comprise B-contg. Li Mn mixed oxides.

IT **68848-64-6P**
(**anode**; lithium secondary **battery** with Li-Si alloy **anodes** placed in between a pair of **cathodes** for excellent cycle characteristics)

RN 68848-64-6 HCA

CN Lithium alloy, nonbase, Li,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Li	7439-93-2
Si	7440-21-3

IC ICM H01M004-40
ICS H01M004-02; H01M010-40; C22C024-00

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56

ST **nonaq** secondary **battery** lithium silicon **anode**; flat plate lithium silicon alloy **battery** **anode**

IT Intercalation
(electrochem. or lamination, of lithium; lithium secondary **battery** with Li-Si alloy **anodes** placed in between a pair of **cathodes** for excellent cycle characteristics)

IT **Battery anodes**
(lithium secondary **battery** with Li-Si alloy **anodes** placed in between a pair of **cathodes** for excellent cycle characteristics)

IT Secondary **batteries**
(lithium; lithium secondary **battery** with Li-Si alloy **anodes** placed in between a pair of **cathodes** for excellent cycle characteristics)

IT **68848-64-6P**
(**anode**; lithium secondary **battery** with Li-Si alloy **anodes** placed in between a pair of **cathodes** for excellent cycle characteristics)

IT 12163-00-7P, Lithium manganese oxide (Li2MnO3) 153327-02-7P, Boron lithium manganese oxide
(**cathode**; lithium secondary **battery** with Li-Si alloy **anodes** placed in between a pair of **cathodes** for excellent cycle characteristics)

IT 7439-93-2, Lithium, uses
(intercalation in silicon **anodes** by electrochem. process or lamination; lithium secondary **battery** with Li-Si alloy **anodes** placed in between a pair of **cathodes** for excellent cycle characteristics)
IT 7440-21-3, Silicon, uses
(intercalation of lithium by electrochem. process or lamination; lithium secondary **battery** with Li-Si alloy **anodes** placed in between a pair of **cathodes** for excellent cycle characteristics)

L27 ANSWER 6 OF 18 HCA COPYRIGHT 2003 ACS on STN
136:9091 Dual cation rechargeable **electrochemical battery cell**. Amatucci, Glenn (Telcordia Technologies, Inc., USA). PCT Int. Appl. WO 2001091209 A1 20011129, 23 pp. DESIGNATED STATES: W: AU, CA, CN, IL, IN, JP, KR, MX, SG; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2001-US14681 20010507. PRIORITY: US 2000-577643 20000524.
AB A rechargeable **battery** cell having high operating voltage and significantly increased specific capacity comprises a pos. **electrode** member, a neg. **electrode** member, and an interposed separator member contg. an electrolyte comprising a soln. of a polyvalent cation solute in a **nonaq**. solvent. The pos. **electrode** member comprises an active material which reversibly takes up and releases the reactive polyvalent cation species during operation of the cell while the active material of the neg. **electrode** contemporaneously reversibly releases into and takes up from the electrolyte solvent a monovalent cation species. Preferred cation species are those of alk. earth metals, such as Y3+, and alkali metals, such as Li+.
IT **68848-64-6**
(dual cation rechargeable **electrochem. battery cell**)
RN 68848-64-6 HCA
CN Lithium alloy, nonbase, Li,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Li	7439-93-2
Si	7440-21-3

IC ICM H01M004-40
ICS H01M004-48; H01M004-50; H01M004-52; H01M004-58; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery nonaq** electrolyte polyvalent cation solute
IT Alloys, uses
(alkali metal; dual cation rechargeable **electrochem. battery cell**)
IT Alkali metals, uses

(alloys; dual cation rechargeable **electrochem. battery cell**)

IT **Battery** electrolytes
Secondary **batteries**
(dual cation rechargeable **electrochem. battery cell**)

IT Alkali metals, uses
Carbonaceous materials (technological products)
Transition metal oxides
Transition metal sulfides
(dual cation rechargeable **electrochem. battery cell**)

IT Carbon black, uses
(dual cation rechargeable **electrochem. battery cell**)

IT Transition metal halides
(fluorides; dual cation rechargeable **electrochem. battery cell**)

IT Fluorides, uses
(transition metal; dual cation rechargeable **electrochem . battery cell**)

IT Lithium alloy, base
Sodium alloy, base
(dual cation rechargeable **electrochem. battery cell**)

IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate 1314-62-1, Vanadium pentoxide, uses 7439-93-2, Lithium, uses 7440-23-5, Sodium, uses 7791-03-9, Lithium perchlorate 11099-11-9, Vanadium oxide 11104-61-3, Cobalt oxide 11129-60-5, Manganese oxide 51311-17-2, Carbon fluoride 52093-30-8, Yttrium tris(trifluoromethanesulfonate) **68848-64-6**
(dual cation rechargeable **electrochem. battery cell**)

IT 12067-55-9, Yttrium silicide YSi2 14017-56-2, Yttrium perchlorate y(clo4)3
(dual cation rechargeable **electrochem. battery cell**)

IT 9011-17-0, Kynar 2801
(dual cation rechargeable **electrochem. battery cell**)

IT 84-74-2, Dibutyl phthalate
(plasticizer; dual cation rechargeable **electrochem. battery cell**)

IT 12597-68-1, Stainless steel, uses
(substrate; dual cation rechargeable **electrochem. battery cell**)

L27 ANSWER 7 OF 18 HCA COPYRIGHT 2003 ACS on STN
134:342560 **Nonaqueous** secondary **battery** containing silicic material. Idota, Yoshio; Matsufuji, Akihiro; Mori, Nobufumi; Kase, Akira; Kagawa, Yoshikatsu; Miyamoto, Hajime (Fuji Photo Film Co., Ltd., Japan). U.S. US 6235427 B1 20010522, 19 pp.

(English). CODEN: USXXAM. APPLICATION: US 1999-309309 19990511. PRIORITY: JP 1998-130836 19980513; JP 1998-165501 19980612; JP 1998-167446 19980615; JP 1998-171665 19980618.

AB A **nonaq**. secondary **battery** is disclosed, comprising a pos. **electrode** having a pos. **electrode** active material, a neg. **electrode** having a neg. **electrode** material, and a **nonaq**. electrolyte, wherein the pos. **electrode** active material is a transition metal oxide capable of intercalating and deintercalating lithium, and the neg. **electrode** material comprises at least one silicic material capable of intercalating and deintercalating lithium selected from silicon, a silicon alloy and a silicide, and a process for producing the **nonaq**. secondary **battery** is disclosed.

IT **68848-64-6**
(**nonaq**. secondary **battery** contg. silicic material)

RN 68848-64-6 HCA

CN Lithium alloy, nonbase, Li,Si (9CI) (CA INDEX NAME)

Component	Component Registry Number
Li	7439-93-2
Si	7440-21-3

IC ICM H01M004-58

NCL 429218100

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery anode** silicic material

IT Fluoropolymers, uses
(binder; **nonaq**. secondary **battery** contg. silicic material)

IT Ceramics
(coating; **nonaq**. secondary **battery** contg. silicic material)

IT Metals, uses
(coating; **nonaq**. secondary **battery** contg. silicic material)

IT Intercalation
(electrochem.; **nonaq**. secondary **battery** contg. silicic material)

IT Secondary **batteries**
(lithium; **nonaq**. secondary **battery** contg. silicic material)

IT **Battery anodes**
(**nonaq**. secondary **battery** contg. silicic material)

IT Carbon black, uses
(**nonaq**. secondary **battery** contg. silicic material)

IT Plastics, uses

(thermoplastics, coating; **nonaq**. secondary **battery** contg. silicic material)

IT Silicon alloy, base
(**nonaq**. secondary **battery** contg. silicic material)

IT 24937-79-9, Poly(vinylidene fluoride)
(binder; **nonaq**. secondary **battery** contg. silicic material)

IT 7440-02-0, Nickel, uses 7440-22-4, Silver, uses 7440-66-6, Zinc, uses
(coating; **nonaq**. secondary **battery** contg. silicic material)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 1344-28-1, Alumina, uses 7440-44-0, Carbon, uses 7631-86-9, Silica, uses 12190-79-3, Cobalt lithium oxide colio2 12675-05-7 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 116226-26-7 120440-46-2 145634-33-9 174180-05-3, Cobalt lithium oxide CoLi0-1.2O2 174180-06-4, Lithium nickel oxide Li0-1.2NiO2 214636-25-6 214636-26-7 253432-73-4 253432-74-5 253432-75-6 253432-76-7 296800-04-9, Lithium manganese oxide Li0-1.2MnO2 338459-39-5, Iron lithium oxide (FeLi0-1.2O2) 338459-40-8 338459-41-9 338459-42-0 338459-43-1 338459-44-2 338459-45-3 338459-46-4 338459-47-5
(**nonaq**. secondary **battery** contg. silicic material)

IT **68848-64-6**
(**nonaq**. secondary **battery** contg. silicic material)

IT 7439-93-2, Lithium, uses
(**nonaq**. secondary **battery** contg. silicic material)

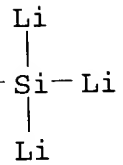
IT 7782-42-5, Graphite, uses
(**nonaq**. secondary **battery** contg. silicic material)

IT 7440-21-3, Silicon, uses
(**nonaq**. secondary **battery** contg. silicic material)

L27 ANSWER 8 OF 18 HCA COPYRIGHT 2003 ACS on STN
132:66687 **Non-aqueous** electrolytic secondary **battery** and manufacture of the **battery**. Suzuki, Ryuta (Fuji Photo Film Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2000011997 A2 20000114, 14 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-173378 19980619.

AB The **non-aq**. electrolytic secondary **battery** comprises a **cathode** contg. a Li-transition metal oxide type active mass and an **anode** which contains a Si-contg. compd. capable of absorbing and discharging Li and is produced by dispersing and kneading the Si-contg. compd. in the presence of water, applying the resultant paste to a collector, and drying the collector. The **battery** has a high energy d. and a long cycle life.

IT 63784-76-9, Lithium silicide (Li4Si)
(**non-aq**. electrolytic secondary **battery** comprising **anode** contg. silicon compd. capable of absorbing and desorbing lithium for high energy d. and long cycle life)
RN 63784-76-9 HCA
CN Lithium, .mu.4-silanetetrayltetra- (9CI) (CA INDEX NAME)



IC ICM H01M004-02
ICS H01M004-04; H01M004-58; H01M004-62; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** silicon compd **anode** active mass
IT Fluoropolymers, uses
Styrene-butadiene rubber, uses
(binder, **anode** active mass contg.; **non-aq**. electrolytic secondary **battery** comprising **anode** contg. silicon compd. capable of absorbing and desorbing lithium for high energy d. and long cycle life)
IT Secondary **batteries**
(lithium; **non-aq**. electrolytic secondary **battery** comprising **anode** contg. silicon compd. capable of absorbing and desorbing lithium for high energy d. and long cycle life)
IT **Battery anodes**
(**non-aq**. electrolytic secondary **battery** comprising **anode** contg. silicon compd. capable of absorbing and desorbing lithium for high energy d. and long cycle life)
IT 7782-42-5, Graphite, uses
(**anode** active mass contg. silicon compd. and; **non-aq**. electrolytic secondary **battery** comprising **anode** contg. silicon compd. capable of absorbing and desorbing lithium for high energy d. and long cycle life)
IT 24937-79-9, Poly(vinylidene fluoride)
(binder, **anode** active mass contg.; **non-aq**. electrolytic secondary **battery** comprising **anode** contg. silicon compd. capable of absorbing and desorbing lithium for high energy d. and long cycle life)
IT 12190-79-3, Cobalt lithium oxide (CoLiO2)
(**cathode** active mass; **non-aq**. electrolytic secondary **battery** comprising **anode** contg. silicon compd. capable of absorbing and desorbing lithium for high energy d. and long cycle life)
IT 7631-86-9, Silica, uses

(mixt. with silicon; **non-aq**. electrolytic secondary **battery** comprising **anode** contg. silicon compd. capable of absorbing and desorbing lithium for high energy d. and long cycle life)

IT **63784-76-9**, Lithium silicide (Li4Si)
(**non-aq**. electrolytic secondary **battery** comprising **anode** contg. silicon compd. capable of absorbing and desorbing lithium for high energy d. and long cycle life)

IT 193072-79-6
(**non-aq**. electrolytic secondary **battery** comprising **anode** contg. silicon compd. capable of absorbing and desorbing lithium for high energy d. and long cycle life)

IT 7440-21-3, Silicon, uses
(polycrystal; **non-aq**. electrolytic secondary **battery** comprising **anode** contg. silicon compd. capable of absorbing and desorbing lithium for high energy d. and long cycle life)

IT 7440-02-0, Nickel, uses
(silicon coated with; **non-aq**. electrolytic secondary **battery** comprising **anode** contg. silicon compd. capable of absorbing and desorbing lithium for high energy d. and long cycle life)

IT 9003-55-8
(styrene-butadiene rubber, binder, **anode** active mass contg.; **non-aq**. electrolytic secondary **battery** comprising **anode** contg. silicon compd. capable of absorbing and desorbing lithium for high energy d. and long cycle life)

L27 ANSWER 9 OF 18 HCA COPYRIGHT 2003 ACS on STN
131:90279 High performance lithium ion polymer cells and **batteries**. Xue, Jiayu Simon (UltraLife Batteries, Inc., USA). U.S. US 5928812 A 19990727, 22 pp. (English). CODEN: USXXAM. APPLICATION: US 1997-929486 19970915. PRIORITY: US 1996-31174 19961118.

AB Cells, esp. solid state rechargeable lithium ion-contg. cells having significantly improved cell shelf-life, cycle life and reduced impedance growth are disclosed. A non-**cathode** active lithium compd. contg. one or more nonmetallic elements, such as Li2CO3 and Li2B4O7, substantially insol. in the **nonaq**. **electrolyte** of the **cell**, is dispersed throughout the **cathode** and is further dispersed within at least one of the **anode** and separator.

IT **55575-96-7**, Lithium silicide li13si4 **61812-08-6**, Lithium silicide li21si8
(high performance lithium ion polymer cells and **batteries**)

RN 55575-96-7 HCA
CN Lithium silicide (Li13Si4) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Si	4	7440-21-3
Li	13	7439-93-2

RN 61812-08-6 HCA
CN Lithium silicide (Li21Si8) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Si	8	7440-21-3
Li	21	7439-93-2

IC ICM H01M010-08
NCL 429304000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST lithium polymer **battery**
IT Carbon black, uses
(high performance lithium ion polymer cells and **batteries**
)
IT Secondary **batteries**
(lithium; high performance lithium ion polymer cells and **batteries**)
IT 96-49-1, Ethylene carbonate 553-91-3, Lithium oxalate 554-13-2, Lithium carbonate 616-38-6, Dimethyl carbonate 7440-44-0, Carbon, uses 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7789-24-4, Lithium fluoride, uses 7791-03-9, Lithium perchlorate 10102-24-6, Lithium silicate li2sio3 10377-48-7, DiLithium sulfate 10377-51-2, Lithium iodide 10377-52-3, Lithium phosphate li3po4 12007-41-9, Boron lithium oxide b3lio5 12007-60-2, Lithium tetraborate 12008-40-1, Boron lithium oxide (B8Li2O13) 12057-24-8, Lithium oxide li2o, uses 12057-29-3, Lithium phosphide li3p 12136-60-6, Lithium selenide 12259-48-2, Lithium phosphide lip 13453-69-5, Boron lithium oxide blio2 13453-84-4, Lithium silicate li4sio4 13453-87-7, DiLithium sulfite 13568-46-2, Lithium silicate (Li2Si2O5) 13762-75-9, Lithium phosphate lipo3 13774-55-5, Lithium borate Li4B2O5 13774-56-6, Lithium borate Li3BO3 13843-41-9, Lithium phosphate li4p2o7 14283-07-9, Lithium tetrafluoroborate 15593-52-9, Selenic acid, dilithium salt 16150-51-9, Lithium silicate li2si3o7 21324-40-3, Lithium hexafluorophosphate 26134-62-3, Lithium nitride li3n 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 34669-40-4, Lithium dithionate 39457-42-6, Lithium manganese oxide **55575-96-7**, Lithium silicide li13si4 **61812-08-6**, Lithium silicide li21si8 90076-65-6 132843-44-8
(high performance lithium ion polymer cells and **batteries**
)
IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer

(high performance lithium ion polymer cells and **batteries**
)

L27 ANSWER 10 OF 18 HCA COPYRIGHT 2003 ACS on STN
130:141692 **Nonaqueous** electrolyte **batteries** using silicon alloy **anodes**. Inamasu, Tokuo (Yuasa Battery Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11007979 A2 19990112 Heisei, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-159078 19970617.
AB The title **batteries** use **anodes** contg. Si alloys SiMx (M = .gtoreq.1 of alloying elements; x >0) and electrolytes contg. C-contg. salts. The **batteries** have high energy d., long cycle life, and safety.
IT **149145-58-4**, Lithium 63.2, silicon 36.8 (atomic)
(**anodes**; **nonaq. batteries** with silicon alloys and C-contg. electrolyte salts)
RN 149145-58-4 HCA
CN Silicon alloy, base, Si 70,Li 30 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Si	70	7440-21-3
Li	30	7439-93-2

IC ICM H01M010-40
ICS H01M010-40; H01M004-02; H01M004-38
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST silicon alloy **anode** lithium **battery** safety; fluorocarbon salt **nonaq** electrolyte **battery**
IT **Battery anodes**
Battery electrolytes
Safety
(**nonaq. batteries** with silicon alloy **anodes** and C-contg. electrolyte salts)
IT 11135-64-1, Iron 50, silicon 50 (atomic) 12007-50-0, Boron silicide (B3Si) 12042-55-6, Aluminum silicide (AlSi) 12137-64-3, Silicon phosphide (SiP) 12255-38-8, Silicon arsenide (SiAs) 37352-26-4 54741-77-4 58847-28-2, Silicon 25, vanadium 75 (atomic) 71894-70-7, Nickel 66.7, silicon 33.3 (atomic) 100502-97-4, Calcium 50, silicon 50 (atomic) 101180-12-5, Silicon 50, tungsten 50 (atomic) 107312-84-5, Platinum 50, silicon 50 (atomic) 116276-95-0, Silicon 50, titanium 50 (atomic) **149145-58-4**, Lithium 63.2, silicon 36.8 (atomic) 152003-65-1, Cobalt 50, silicon 50 (atomic)
(**anodes**; **nonaq. batteries** with silicon alloys and C-contg. electrolyte salts)
IT 90076-65-6, Lithium bis(trifluoromethylsulfonyl)amide 132843-44-8
(electrolytes; **nonaq. batteries** with silicon alloy **anodes** and C-contg. salts)

L27 ANSWER 11 OF 18 HCA COPYRIGHT 2003 ACS on STN